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*Abstract*

# Photopolymerization as a Method for Synthesis Hydrogel-Based Transdermal Systems †

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**Abstract:** Photopolymerization has emerged as a powerful technique for designing hydrogel-based transdermal delivery systems. This innovative method harnesses light-induced chemical reactions to create crosslinked hydrogel networks, offering precise control over drug release and enhanced therapeutic outcomes. This abstract explores the multifaceted role of photopolymerization in the formulation of transdermal hydrogel systems, discussing its principles, advantages, and diverse applications. One of the primary advantages of photopolymerization is its ability to achieve rapid and on-demand gelation. This facilitates the incorporation of a wide range of therapeutic agents, including hydrophobic drugs and biologics, into the hydrogel matrix. Additionally, the spatiotemporal control afforded by photopolymerization enables the creation of gradient drug release profiles, optimizing drug permeation through the skin. This abstract described challenges associated with photopolymerization-based hydrogel systems. The potential of photopolymerization to revolutionize the transdermal drug delivery field, by providing precise dosing control and minimizing skin irritation, makes it an exciting area of research in pharmaceutical and biomaterial sciences.

**Keywords:** photopolymerization; hydrogels; transdermal systems

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